Nov. 13, 1923. 1,473,606

A. H. BRANDON

FISHING APPARATUS FOR WELLS

Filed May 10, 1919

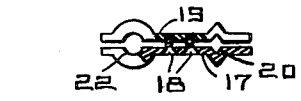


Fig. 3

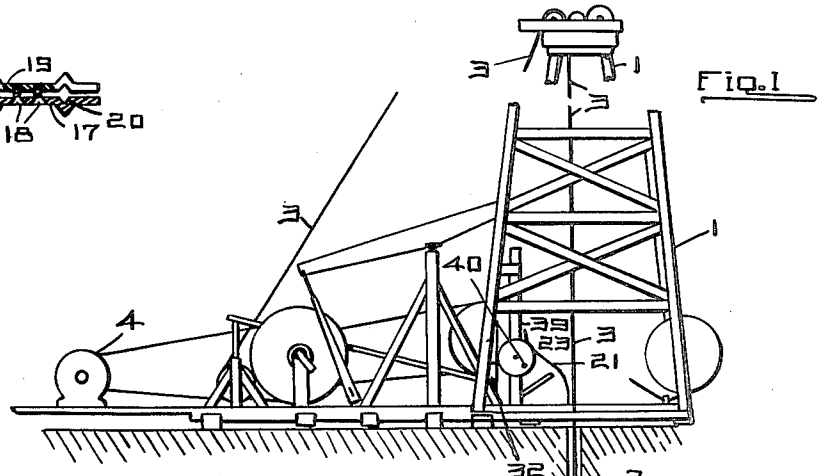


Fig. 1

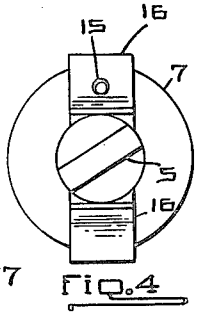


Fig. 4

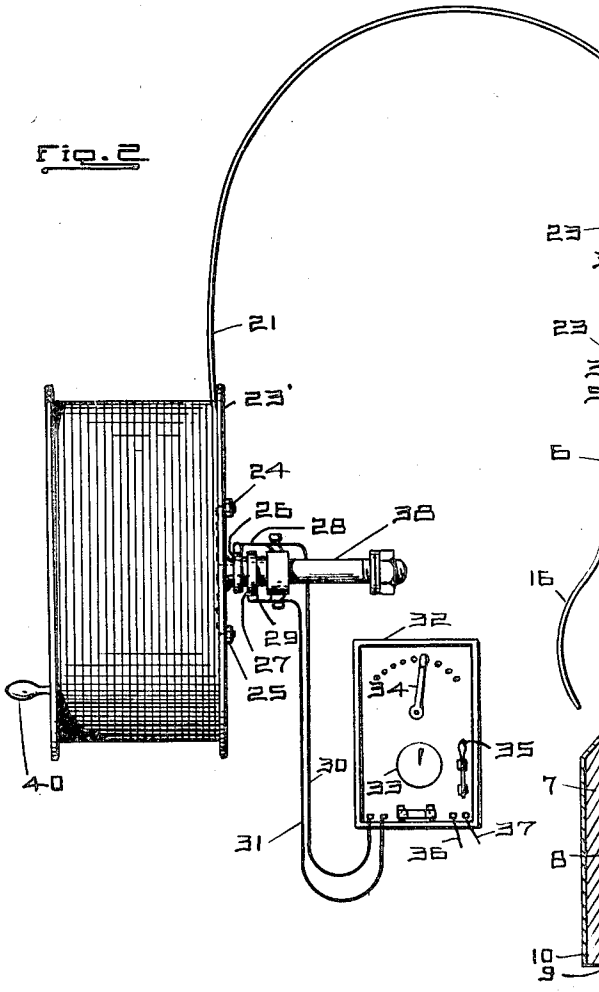


Fig. 2

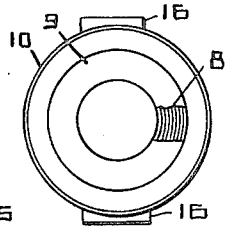


Fig. 5

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Patented Nov. 13, 1923. 1,473,606

UNITED STATES PATENT OFFICE.

ARTHUR H. BRANDON, OF TOLEDO, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE DEEP WELL ENGINEERING COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

FISHING APPARATUS FOR WELLS.

Application filed May 10, 1919. Serial No. 296,151.

To all whom it may concern:

Be it known that I, ARTHUR H. BRANDON, a citizen of the United States of America, residing at Toledo, Lucas County, Ohio, have invented new and useful Fishing Apparatus for Wells, of which the following is a specification.

This invention relates to apparatus for engaging and hoisting materials from places normally difficult of access.

This invention has utility in fishing drill parts and other broken or detached members from wells, especially deep wells of the artesian, gas, or petroleum type.

Referring to the drawings:

Fig. 1 is a fragmentary side elevation of an oil well derrick showing an adaptation of the invention thereto;

Fig. 2 is a view partly in section of the apparatus of this invention;

Fig. 3 is a plan view with parts broken away of one of the guides of the device;

Fig. 4 is a plan view of the tool engaging electro-magnet; and

Fig. 5 is a bottom plan view of the tool engaging electro-magnet.

The derrick 1 is shown as in position over a well 2. This derrick 1 has a sand line 3 which may be operated from a motor 4. For light work use, the sand line may be readily used as the hoisting line in the fishing apparatus of this disclosure, and instead of the main hoisting or drilling line being attached to the apparatus the hoisting line 3 is shown as connected to eye 5 having roller bearing 6 giving such eye 5 a swivel connection with main magnet member 7 having a coil 8. The magnet member 7 comprises an armature portion between inner and outer concentric poles, which together form a rigid unit. The coil 8 surrounds the first or central pole of the electromagnet, while this coil 8 is surrounded by the second or outer ring shaped pole of the electromagnet. This coil 8 is firmly mounted in the magnet and has a waterproof coating 9 retaining the coil 8 and sealing the magnet, while the magnet itself has water-proof nonmagnetic armor coating or jacket 10. One line of the coil 8 may have terminal ground connection 11 with the magnet 7, while the other terminal may pass by duct 12 to terminal 13, and thence as joined by line from the magnet 7, the conductor pair may pass by flexible conduit 14 through opening 15 in retarding guide or center spacing member 16 carried on the neck of the magnet 7 below the eye 5.

Clamp member 17 may be connected by screws 18 to opposing clamp member 19 to provide a holding or gripping portion 20 engaging the conductor pair 21. These members 17, 19, provide a guide portion 22 through which may freely turn the hoisting line 3. This hoisting line 3 may be provided at desired intervals with stops 23. In practice these stops 23 are merely knots of line or rope to firmly engage or grip the line 3 and hold to be abutted by clamps 17, 19.

This conductor pair 21 extends to reel 23′ having terminals 24, 25, for the respective lines of the conductor pair 21. From the terminal 24 extends a conductor line to slipring 26 and from the terminal 25 extends another conductor line to slipring 27 at the commutator reel structure brushes.

The sliprings 26, 27, respectively have brushes 28, 29, from which extend lines 30, 31, to control box 32. In this control box 32 is mounted an ammeter 33, a rheostat 34, and a knife switch 35, so that by operation of the knife switch 35 the supply of current from lines 36, 37, may be cut off from the apparatus.

This reel 23′ has a mounting shaft 38 which in practice may be supported at a desirable position in the derrick 1, say as on headache post 39, and as so mounted the reel 23′ may be readily manually controlled by handle 40 for winding up or unwinding the conductor line 21.

In practice when a drill has been disconnected or some metallic piece of iron or steel has become loosened in the well and is not readily engaged for removal, the drill stem may be taken out or the hoisting line withdrawn. The sand line and its bucket may also be out of the well. With the well thus cleared of the normal operating members, the apparatus of this disclosure may be brought into use. For instance, as herein, the sand line 3 may be connected as a hoisting line to the eye 5 of the electromagnet and the electro-magnet lowered into the well 2. While the electro-magnet 7, a finishing tool engaging device, is armored in itself, it is desirable, especially in it operation under water and near the lower

limits of the drill portion of the well, that full protection be afforded such device. To this end the conductor lines are preferably carried in an armor conduit 14 of the flexible type, say for a distance of eight or ten feet above the eye 5, at which point this conduit may be connected by clamps 17, 19, to the hoisting line 3. According to the desires of the operator and the general conditions confronted in the well, the clamps 17, 19, may be disposed, say in ranges from two hundred fifty to five hundred feet apart. These clamps 17, 19, firmly engage the conductor line or pair 21 and thus are held by it as guides loosely coacting at the guide portion 22 with the hoisting line 3, upon which they may accordingly slide down to abut the stops 23 and sustaining the conductor 21. These stops 23 may be left upon the line 3 when once in position if desired, while the clamps 17, 19, are placed in position on the conductor pair 21 as such pair is sent down into the well 2 from off the reel 23'. As the hoisting line 3 is paid out to let the magnet 7 descend into the well, the conductor pair 21 is also freed to pay out to such region so that there is no cling or pull on the conductor pair 21.

When the lowering of the magnet 7 has reached the region of the article lost which it is desired to remove from the well 2, switch 35 may be thrown in and then the handle of the rheostat 34 moved to give the desired amount of current flow as indicated by the ammeter 33 in the control box 32. The commutator reel 23' provides the current connection so that the electro-magnet is at once energized and hoisting of the line 3 may be started with such care and at such rate as the operator may deem desirable. Even with fragment of under reaming drill or other parts which are thrown to one side or slightly out of the direct line of the hole of the well 2, the magnet 7 may directly and properly engage to remove from the well, for not-withstanding the original magnetic contact may be to one side, with a gradual hoisting, the magnetism will hold the fragment as the fragment adjusts itself in the well for ascent. The member 16, as a friction guide, is of a size according to the hole in which operating, and prevents any twisting of the magnet 7 in its ascent or descent in the well. This guide may even be sprung to care for different sized tubes. There is thus avoided any twisting of the conductor pair 21, which twisting would introduce trouble in separating the hoisting line 3 from this conductor pair 21 in getting the tool up out of the well.

As the magnet and its fished out part ascend from the well, the first clamp pair 17 19, reaching the top of the well, is removed by taking out the screws 18. The ascent is then continued until the next clamp pair 17, 19, comes to the surface, which is removed and the withdrawal then proceeds.

The magnet 7 may be of such weight to give a slight jar in action but it is not primarily designed for jar use. The weight of the magnet 7 is sufficiently greater than the resistance of the guide 16 so that the centering guide does not interfere with the descent of magnet under its own weight. Besides the magnet itself being waterproof, the connection or conductor line pair 21 is also waterproof, so that there may not be action from the salt water, oil, etc., which may be in the well. The frequency of use of this fishing apparatus determines whether or not the line 21 should be replaced between each operation. It is essential that such line be in good condition and that there be no breaks in the insulation.

What is claimed and it is desired to secure by Letters Patent is:

1. A fishing apparatus for wells including an electro-magnet engaging tool, a hoisting line for the tool, and an additional conductor line for the tool, said tool comprising a stem engaged by the hoisting line, a first pole in alignment therewith, and an enlargement providing a second pole about the first pole.

2. A fishing apparatus for wells including an electro-magnet engaging tool, independent hoisting and conductor lines for the tool, and directing means for the conductor line coacting between the hoisting and conductor lines to preclude twisting of the conductor line as to the hoisting line.

3. A fishing apparatus for wells including an electro-magnet engaging tool, a hoisting line for the tool, stops carried by the hoisting line, and a conductor line having guides coacting with the hoisting line for spacing therefrom and sustaining the conductor lines.

4. A fishing apparatus for wells including an electro-magnet engaging tool, a hoisting line for the tool, and a spring guide arm for centering the tool and retarding the tool in the well from rotative movement as to the well for reducing the tendency to twist said line.

5. A fishing apparatus for wells including an electro-magnet engaging tool having a coil, a hoisting line for the tool, a conductor line for supplying electric current to the coil of the tool, and a commutator reel for the conductor line.

In witness whereof I affix my signature.

A. H. BRANDON.